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The Mathematical Language and Performance in Beckett's *Happy Days*

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Abstract: *Happy Days* is one of the masterpieces of Irish playwright Samuel Beckett (1906-1989), and includes many mathematical concepts, logics and thoughts. This thesis will analyze this play again, from a brand-new perspective of mathematics, respectively focusing on its stage setting—the gradually rising mound and the heroin's buried body can be performed by the mathematical concepts of Limit and Sequence; then its characters—Winnie and Willie's psycho-situation and relationship can be presented by the standard conic of Hyperbola in mathematics; and finally, its language—the features of the couple's speeches can also be displayed by the Hyperbola. This thesis demonstrates the important inner relationships between *Happy Days* (literature) and mathematics, penetrating into the essence of the play by using mathematical analysis, and promoting the interdisciplinary study.

Key Words: *Happy Days*; mathematics; interdisciplinary study

1. INTRODUCTION

Samuel Beckett (1906-1989), an Irish novelist, poet and playwright in the 20th century, is most famous for his plays of the Theatre of the Absurd, which made him win the Nobel Prize for Literature in 1969 for his "writing, which—in new forms for the novel and drama—in the destitution of modern man acquires its elevation"(Net.1). His plays are concerned with human suffering and survival, and his characters are struggling with meaninglessness, alienation and the world of the Nothingness, expressed by means of the innovative scene and props, the fragmentation of language, the subversive plot and structure, etc.. *Happy Days* is a two-act play written in English in 1961, in which Winnie, stuck in one spot and sinking into the earth, and her husband Willie, also hidden by mound to Winnie's right and rear, share the meaningless minutiae of life; Winnie is ironically optimistic, while Willie is indifferent and torpid. It is a masterpiece of Beckett's plays and also a classic example of the Theatre of the Absurd.

Traditionally, most researches on *Happy Days* were about its absurdity, symbols and metaphors, language, etc. from the perspectives of meta-theatre, context-analysis, philosophy and other literary criticism. This thesis will analyze this play again, from a brand-new perspective of mathematics—that is thought much of by Beckett who remarked in an interview: "Mathematics is a means of communication without meaning."(Schlossberg: 51)—, in hope to broaden the horizons and methods for studying Beckett's and other literary works, as well as promote the interdisciplinary researches.

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2. LITERATURE REVIEW

The most traditional methods of researching on *Happy Days* were close to meta-theatre theory, context-analysis, philosophy of Existentialism and other literary criticism, e.g. “Negative Definition in Samuel Beckett’s *Happy Days*”(David J. Alpaugh 1966), “The Duetto in Beckett’s Plays—On *Krapp’s Last Tape* and *Happy Days*”(Yan 2007), “Somniloquy with Lucidity Existential Paradox—On Winnie in *Happy Days*”(Zhan 2007), etc.

Until now, a few scholars have begun to notice the interrelations between mathematics and Beckett’s works, and their importance and meanings: *A Companion to Samuel Beckett* (Gontarski 2010) indicates that mathematics appears frequently in Samuel Beckett’s writing, adopting the “purgatorial calculus” in *Quad* as a case study; “Mathematics as Metaphor: Samuel Beckett and the Esthetics of Incompleteness” (Culik 1993) points out the non-literary fields such as mathematics, neurology and aphasiology can represent the metaphoric power of Beckett’s novels; “A glance at SunSet: Numerical fundaments in Frege, Wittgenstein, Shakespeare, Beckett.” (Smyth 1995) focuses on mimesis, order and exclusion in the fields of literature and mathematics by examining the works of Gottlob Frege, Ludwig Wittgenstein, William Shakespeare and Samuel Beckett; “The Mathematical Limit”(Mercier 1959) demonstrates each of Beckett’s works as an equation would undoubtedly easier be represented graphically first and then algebraically, taking the Paris editions of the books *Watt* and *The Unnamable*, etc.

However, the above materials do not mention *Happy Days*, as for this play, Michael Worton in his article “‘Waiting for Godot’ and ‘Endgame’ ” applies Achilles and the tortoise in Zeno’s paradoxes of Motion to describe Winnie’s being embedded and sunk in the mound.(Worton: 80) Elizabeth Klaver expatiates the paradoxes of infinity in *Happy Days* to prove many of Beckett’s plays can be recognized as performances of mathematics.(Klaver 2005) Although Klaver’s article could be the most reasoned and elaborate one, its goal is to unpack the mathematics not literature or other deeper meanings. Therefore, this thesis will take the above materials as basis, broaden and enrich the present horizons and viewpoints of mathematical analysis of *Happy Days*, and penetrate into the essence of the play by using mathematical analysis.

3. STAGE SETTING, SEQUENCE, AND LIMIT

Elizabeth Klaver explored the same sort of infinity in Achilles the Tortoise of Zeno’s Paradoxes, and in *Happy Days* concerning the question of whether Winnie will be completely buried by the earth. Zeno’s Paradox is regularly used to introduce the notion of an infinite sequence in math texts on real analysis, the theoretical underpinning of calculus, illustrating that counter to common sense, a sequence of decreasing steps toward a goal does not mean one can actually reach the goal (Klaver 16), among which, Achilles allows the tortoise a head start of 100 meters, supposing that each racer starts running at some constant speed (Achilles very fast and the tortoise very slow), then after some finite time, Achilles will have run 100 meters, bringing him to the tortoise’s starting point; but during this time, the tortoise has run a much shorter distance, say, 10 meters that will then take Achilles some further time to run that distance, by which time the tortoise will have advanced farther; and then more time still to reach this third point, while the tortoise moves ahead. Thus, whenever Achilles reaches somewhere the tortoise has been, he still has farther to go. Therefore, because there are an infinite number of points Achilles must reach where the tortoise has already been, he can never overtake the tortoise (Simplicius (b)).

Therefore, as for the stage setting especially the mound in *Happy Days*, it can be easily imagined that Winnie would be imbedded to her jaw in Act 3, to her nose in Act 4, to her eyes in Act 5, or even disappear in some act, which is the same apparent pattern—the increasing constrictions— in the footrace between Achilles and the Tortoise of Zeno’s Paradoxes, and is performed by the mathematical concept of the infinite convergent sequence. Klaver takes such an increasing progression of constrictions applied to Winnie’s body and its jolting descent into the mound, possible to formulate a rule “ $\{ (n, S_n) \}$ ” (n is the number of act; S_n is Winnie’s buried body: $S_n = n/(1+n)$)”(Klaver 17). Thus, substituting for n , Act1 and Act2 produce the equations:

$S_1 = 1/(1+1) = 1/2$ ($n=1$) → 1/2 of her body is buried (“Imbedded up to above her waist”(Beckett 771))

$S_2 = 2/(1+2) = 2/3$ ($n=2$) → 2/3 of her body is buried (“WINNIE imbedded up to neck”(Beckett 778))

$S_3 = 3/(1+3) = 3/4$

$S_4 = 4/(1+5) = 4/5$

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$S_n = n/(1+n)$

To consummate Klaver’s opinion and combine with Beckett’s theme more closely, this thesis would like to adopt the mathematical concept of Limit. In the infinite sequence S_n , when for n close to infinity, the value of the function S_n is said to approach at a limit of 1. The calculative and deductive process is as follows:

$$\begin{aligned}\lim_{n \rightarrow \infty} S_n &= \lim_{n \rightarrow \infty} n/(1+n) = \lim_{n \rightarrow \infty} (n+1-1)/(1+n) \\ &= \lim_{n \rightarrow \infty} (n+1)/(1+n) - \lim_{n \rightarrow \infty} 1/(1+n) \\ &= \lim_{n \rightarrow \infty} 1 - \lim_{n \rightarrow \infty} 1/(1+n) \\ &= 1 - 0 \\ &= 1\end{aligned}$$

Thus, Winnie’s body is concentrated on the mathematical notion that the limit is inevitable but only through infinitely many steps, —she would be buried completely, although she may smother before that—which can further express Beckett’s theme: it is doomed that the mound, representing the indifferent and alienated society, will imbed Winnie some day; and no matter what she tries, say, endeavored to be optimistic, singing, ransack her capacious black bag and so on, she cannot change the fixed end and is no match for the callous modern world; people live in a world full of absurdity, relentlessness, alienation and nothingness, like trapped creatures struggling to escape but helpless to control everything.

4. CHARACTERS AND HYPERBOLA

Beckett likes to play with twosome in his characters (Moore: 529): in *Waiting for Godot* there are Vladimir and Estragon, Pozzo and Lucky; in *Endgame* Hamm and Clov, Nagg and Nell; in *Krapp’s Last Tape* the present Krapp and the past self on the tape, etc.. Winnie and Willie in *Happy Days* are such a twosome of teller and listener, optimism and pessimism, ego and alter ego, and past and present, even like two halves of the soul and humanity—they are symmetrical and opposite, with “the forces of both attraction and repulsion”(Moore 529) and the insurmountable gap between them—physically, Winnie and Willie are buried in two mounds at each side of the stage, “Maximum of simplicity and symmetry”(Beckett 771), cannot reach or touch each other; spiritually, Winnie is more optimistic than Willie, because she is always saying “this is going to be another happy day” and she never used the revolver to get the relief from the reality, while Willie has been callous and despaired to the world because he only attends to the obituaries in the newspaper, which suggests his inclination of death; they cannot communicate indeed, because Winnie always soliloquizes a lot and longs for conversation with Willie, whereas Willie hardly gives any response unless Winnie shouts at and beseeches him. According to the characteristics above, the twosome of Winnie

and Willie can be performed by the standard conic of hyperbola in mathematics. Hyperbola is a plane curve having two branches, formed by the intersection of a plane with both halves of a right circular cone at an angle parallel to the axis of the cone and it is the locus of points for which the difference of the distances from two given points is a constant (Net.2). The basic equation for hyperbola is

$$x^2/a^2 - y^2/b^2 = 1 \quad (a > 0, b > 0, |x| \geq a), \text{ and its graph is as follows:}$$

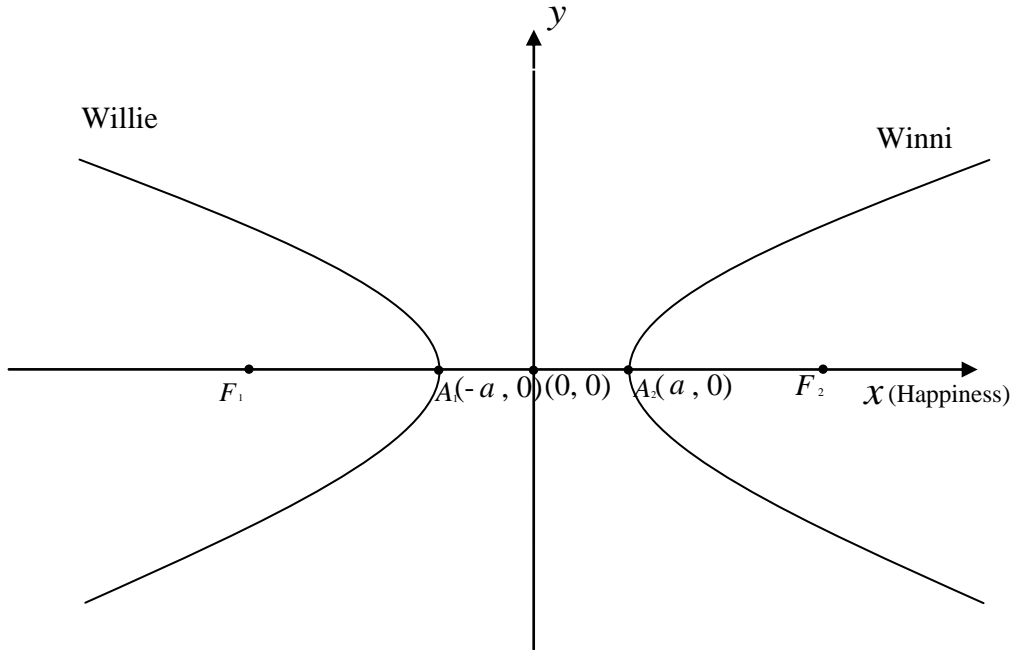


Fig 1

In the rectangular coordinate, X line represents the degree of happiness, when $X \geq a$, the value of the hyperbolic function is Winnie, i.e. $y = \text{Winnie}$; contrarily, while $X \leq -a$, $y = \text{Willie}$. It is obvious that Winnie's locus is the right branch of the hyperbola, which is in the first and forth quadrants, indicating she is optimistic; whereas Willie's locus is the left branch and is in the second and third quadrants, explanting that he is pessimistic. The two loci are symmetrical taking y line as the axis. In addition, because a can equals to any positive number ($a > 0$), i.e. the value of a can get infinitely close to 0 but never equals to 0, which indicates that the two braches of this hyperbola can't intersect, same, Winnie and Willie will never intersect, both physically and spiritually. It also makes out the callous and absurd relationship among modern people, who have no deep and sincere communications.

5. LANGUAGE AND HYPERBOLA

As for the language in this play, it can also be performed by the mathematical concept of the standard hyperbola (Fig 2).

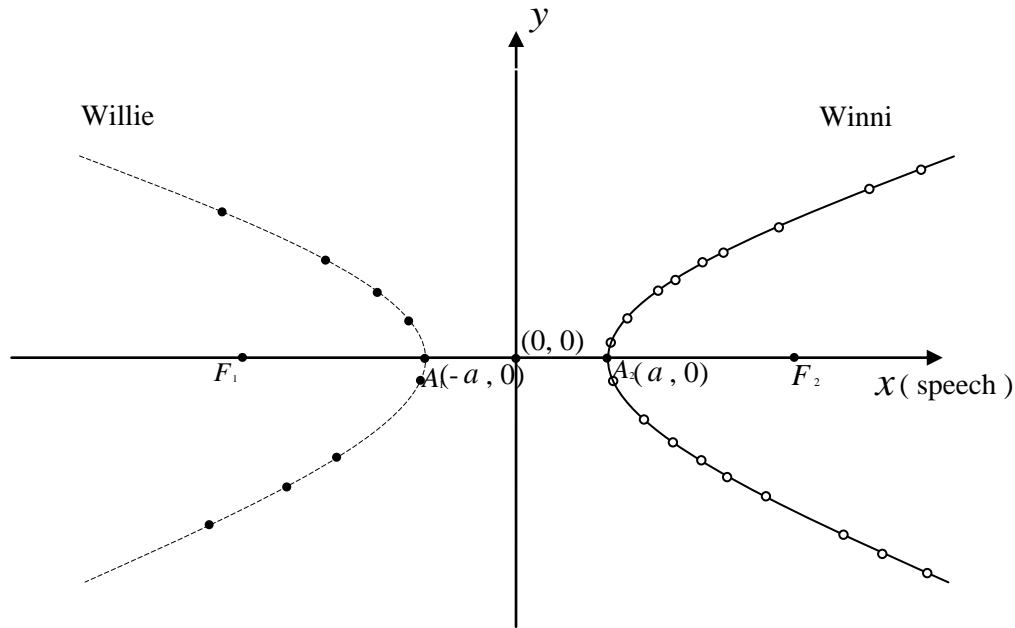


Fig 2

In this rectangular coordinate, \mathcal{X} line is the characters' speech. Through the whole play, Winnie talks ceaselessly and repeats something superficially meaningless and absurd. For instance, she mentions "the old style", "no better, no worse, no change....No pain", etc., which suggests the mechanicalness and nihility of the modern world and her yearning for the old values and life style of the past. In her speech, there are numerous pauses that may happen due to her upset, helplessness, embarrassment, or solitude, making obstacles in communicating with Willie, indicating her struggle for order from absurdity, and also meaning from void and union from the ultimate isolation and alienation of modern people because of her lucidity. The following example can demonstrate her features of language:

WINNIE: Willie. (*Pause. Louder.*) Willie. (*Pause. Eyes front.*) May one still speak of time? (*Pause.*) Say it is a long time now, Willie, since I saw you. (*Pause.*) Since I heard you. (*Pause.*) May one? (*Pause.*) One does. (*Smile.*) The old style. (*Smile off.*) There is no little one can speak of. (*Pause.*) One speaks of it all. (*Pause.*) All one can. (*Pause.*) I used to think...(pause)...I say I used to think that I would learn to talk alone.... To have been always what I am — and so changed from what I was. (*Pause.*) I am the one, I say the one, then the other. (*Pause.*) Now the one, then the other. (*Pause.*) There is so little one can say, one says it all. (*Pause.*) All one can. (*Pause.*) And no truth in it anywhere. (*Pause.*)... (Beckett 778)

Therefore, Winnie's language can be represented by the right branch of the hyperbola in Fig 2. The domain of \mathcal{X} is $[a, +\infty)$, in this range when \mathcal{X} equals to some stochastic positive umbers, the value of y cannot be taken, which denotes the pauses of Winnie's endless speech and is figured by the hollow dots, i.e. Winnie's language is performed as a discontinuous locus of the hyperbola.

On the other hand, Willie's words are extremely few, even not having long and complete sentences, and hardly talking to Winnie initiatively. Willie's language indicates that he has almost lost his interest, hope or happiness to his life, to others and to the whole society, and his existential condition is solitude, nothingness and alienation. For example:

WINNIE:...The lid! (*She watches as he crawls back towards hole. Irritated.*) Not head first, I tell you! (*Pause.*) More to the right. (*Pause.*) The right, I said. (*Pause. Irritated.*) Keep your

tail down, can't you! (Pause.) Now. (Pause.) There! (All these directions loud. Now in her normal voice, still turned towards him.) Can you hear me? (Pause.) I beseech you, Willie, just yes or no, can you hear me, just yes or nothingness.
(Pause.)
WILLIE: Yes.
WINNIE: (Turning front, same voice.) And now?
WILLIE: (irritated.) Yes.
WINNIE: (still less loud.) And now? (A little louder.) And now?
WILLIE: (violently.) Yes!
WILLIE: (same voice.) Fear no more the heat o' the sun. (Pause.) Did you hear that?
WILLIE: (irritated.) Yes.
WILLIE: (same voice.) What? (Pause.) What?
WILLIE: (more irritated.) Fear no more.

Likewise, Willie's language can be performed by the left branch of the hyperbola (Fig 2). Here, The domain of \mathcal{X} is $(-\infty, -a]$, in this range when \mathcal{X} equals to some stochastic negative umbers, the corresponding values of \mathcal{Y} are taken only, which are figured by the solid dots and the untaken part is represented by the dashed. Those solid dots stand for Winnie's fragmentary words, thus the locus of those dots could be the characteristics of Willie's language.

6. CONCLUSION

In conclusion, Beckett's interest and inclination to mathematics can be found and analyzed in *Happy Days*, many elements and characteristics of the play can also be represented by mathematical performances and language: the stage setting, more concretely speaking, the arrangement of the mound, can be performed by the infinite convergent sequence and Limit; the characters (Winnie and Willie) and their language can also elucidated and illustrated by different hyperbolas (Fig 1&Fig 2). Like Klaver says that "mathematics is a highly intuitive and aesthetic discipline. Even the logical proof must be elegant, indeed as elegant as *Happy Days*. The simple fact is that 'doing' mathematics may be far closer to 'doing' literary work than we suspect.", it should be paid more attention to the possibility of interdisciplinary work across the humanistic and scientific fields, and learning the nuts and bolts of the inter-discipline to gain a real sense of interdisciplinary study and literature.

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